

EXECUTIVE SUMMARY

WORLD OIL TRENDS

If world oil demand increases more rapidly than the expected growth in worldwide oil production, volatility in world oil prices could result, adversely affecting the California economy. World production is expected to continue increasing, consistent with increasing estimates of world oil reserves, with more countries producing oil and seeking foreign investment to develop indigenous oil resources. Currently, total world oil production is 66 million barrels a day, of which 40 percent is from the Organization of Petroleum Exporting Countries (OPEC) and 60 percent is nonOPEC. This ratio is a shift from the 1974 ratio of 53 percent OPEC and 47 nonOPEC, thus weakening OPEC's market share of world production.

NonOPEC oil production is currently increasing at a faster rate (70 percent of new production) than OPEC production, despite the decline in production from the United States and the former Soviet Union. This production ratio might not continue beyond the end of the decade because of the smaller size of known reserves in nonOPEC countries. At the present time, the largest known oil reserves are contained in OPEC countries.

The long-term demand forecasts of the International Energy Agency (IEA) suggest that world oil demand will increase an average of 1.8 percent annually to 2010. The most significant growth in world oil demand is expected to come primarily from Asian countries. Conventional thinking assumes that increases in production will keep pace with modest increases in demand. The alternative demand scenario, however, is much more uncertain, with the potential for a very rapid demand increase,

particularly in China, which exceeds the current rate of production. If demand grows faster than production capacity, oil supply markets will tighten, driving up prices worldwide.

Some forecasters believe oil prices may increase considerably from the present rate of \$18 per barrel to \$30 per barrel, or higher, by 2005. This potential increase may be the result of: 1) oil demand increasing more rapidly than expected, 2) OPEC's market share increasing substantially, and 3) nonOPEC reserves dwindling. Other forecasters expect production to be adequate and long-term prices to range between \$15 and \$20 per barrel. History has shown that oil prices have been volatile as a result of a variety of geo-political events, especially those that occur in critical oil producing countries. This volatility is expected to continue, changing the short-term supply and price outlook overnight. Due to the importance of transportation in California, and the transportation sector's dependence on oil, the resulting price shocks could seriously affect the state's overall economy.

T The Energy Commission will continue to encourage the conservation and diversification of energy resources as a prudent approach for California, to mitigate the potential economic consequences of higher oil prices in the future.

CALIFORNIA OIL SUPPLIES AND REFINED PRODUCTS

Declining domestic oil production, in Alaska as well as California, will result in greater California dependency on foreign oil imports from both OPEC and nonOPEC suppliers. Future California oil

production, although uncertain, is expected to decline an average of 2 percent to 3 percent per year during the next 20 years. California's thermally enhanced oil recovery is currently responsible for 63 percent of California's onshore production, but the extent of its use will continue to be sensitive to future oil price paths. More dramatic than the decrease in California production, Alaska oil production is forecast to decline 12 percent per year during the same time period.

The major challenge facing the California oil refining industry during the next decade is not so much the availability of crude oil, but rather the availability of in-state refining capacity to produce sufficient volumes of California-specific reformulated gasoline and diesel. Closure of two small refineries in 1995 brings the total refinery closures in California to 20 since 1982, reducing distillation capacity by 23 percent. To date, the refining industry has compensated for the loss of capacity by increasing utilization rates from about 70 percent in 1982 to 95 percent in 1993, resulting in total output increases. This leaves a limited ability to increase the product output on a sustained basis. Based on current information available from oil companies, California refineries have the ability to meet the demand for Phase 2 RFG in 1996, even under a high demand scenario. If California continues to lose refining capacity over the next decade and demand for refined products remains level or increases, then refiners have the option to either import additional volumes of finished products, import additional refined product blendstocks, or perform refinery modifications (such as debottlenecking).

In the short term, a major unscheduled outage may cause a temporary tight supply situation because of the high utilization rate. However, there are several options available which may help refiners to mitigate the tight supply. First, existing inventories of product and blendstock may be drawn down to meet demand. This option has been made more viable by increased storage capacity in the state as a whole. Second, refiners may seek a California Air Resources Board (CARB) variance to offset the volume of fuel lost by the outage. Third, additional refined products or blendstocks may be imported.

In addition, the Energy Commission is working closely with CARB through the Reformulated Gasoline Assessment Center in order to maintain a high level of readiness to respond quickly and

cooperatively to any event which has the potential to cause an interruption in the supply and availability of Phase 2 RFG.

The declining refining capacity in California, along with new federal and state regulations, have also impacted wholesale and retail marketing in California. Especially with the transition to Phase 2 reformulated gasoline (RFG) in 1996, petroleum marketers will face new challenges and changes in the way they do business in California.

T The Energy Commission will analyze statewide refinery capacity, output and the supply/demand balance within California to evaluate whether adequate supplies of reformulated gasoline are available during the 1996 transition and beyond.

T The Energy Commission should study the potential impacts of different world oil price paths and various levels of oil imports on California's economy.

REFORMULATED FUELS

The need for cleaner air in California and the requirements of the federal Clean Air Act Amendments require CARB to develop cost effective methods of achieving air quality standards. Phase 2 of CARB's reformulated gasoline program requires production of RFG at the refineries by March 1, 1996, availability for sale at the wholesale level by April 15, 1996, and at the retail level by June 1, 1996. Although the transition to CARB Phase 2 RFG will create a gasoline formulation unique to California and pose certain challenges in the way the petroleum industry conducts day-to-day business, implementation of this program is an important step forward in the state's goal of achieving air quality standards.

To meet the fuel specifications for Phase 2 RFG, California refiners have spent more than four billion dollars for refinery upgrades and retrofits. Based on current information available from oil companies, California refineries have the ability to meet the demand for Phase 2 RFG in 1996, even under a high demand scenario. The refining and distribution of Phase 2 RFG pose challenges to the industry in meeting fuel specifications and providing segregated storage for additional product types.

CARB formed an RFG Advisory Committee to facilitate the introduction of CARB Phase 2 RFG in California by providing a forum for discussing issues and concerns with all parties affected by the production, distribution, and use of RFG. The Energy Commission is working closely with CARB to help pave the way for a smooth transition to CARB RFG. It is the shared goal of both agencies to evaluate the petroleum industry's ability to provide Phase 2 RFG to meet the needs of California's motorists.

T The Energy Commission will continue to participate in the RFG Advisory Committee with CARB and report on the petroleum industry's ability to provide Phase 2 RFG to meet the needs of California motorists.

T The Energy Commission is providing the expertise for timely and accurate assessment to decision makers of potential impacts to the supply and distribution of Phase 2 RFG during the transition period.

T The Energy Commission will monitor fuel deliveries to pipeline terminals and provide credible and accurate information on the potential for regional spot shortages.

ALTERNATIVE FUELS AND VEHICLES

The technology for alternative fuel vehicles has developed gradually due to a variety of market and regulatory uncertainties and the competition from plentiful and low priced petroleum fuels. The alternative fuels currently in use in California include M85 (85 percent methanol, 15 percent gasoline), compressed natural gas, propane and electricity.

The availability and use of alternative fuels is expected to increase gradually, potentially to one million vehicles by 2005. The incentive for this increase will be largely in response to regulations for low-emission vehicles. While the overall supply of alternative fuels is not expected to be a significant constraint, the availability of an adequate network of refueling sites may remain a constraint. Forecasts of comparative prices for alternative fuels could change significantly if federal and state excise tax rates are restructured.

T The Energy Commission should consider alternative fuel incentive policies in light of the potential for petroleum fuel price shocks.

NATURAL GAS

Over the past decade, the natural gas market has become increasingly competitive in response to regulatory reforms at the state and federal levels. At the wellhead, natural gas production has been completely deregulated. Given the partially monopolistic nature of gas transmission network which delivers gas from the producer to the end-use customer, regulators still oversee transportation and distribution services offered by pipeline companies and utilities. The use of incentive ratemaking by the CPUC, the implementation of capacity release programs at the federal level, and the development of gas market centers throughout the United States and Canada have allowed regulators to promote market competition in a regulatory environment.

With market competition growing and a push towards more environmentally-acceptable fuels, the outlook for the use of natural gas in California is better than ever. An abundant supply of natural gas is available to California from within the state, as well as from Canada, the Southwest United States, and the Rocky Mountains. During the 20-year forecast horizon, Canadian and Rocky Mountain supplies to California will increase while Southwest gas will slowly relinquish its role as the dominant gas supplier to the state. Natural gas demand in the state will grow 1.2 percent per year. California end-use price changes during the forecast period will range from a 0.1 percent decrease to a 2.7 percent increase annually, depending on the customer sector and the utility service territory.

Despite this optimism, the Energy Commission recognizes that the future direction of the natural gas market could vary considerably, depending on future regulatory action and market development. Among the largest uncertainties are: 1) electricity industry restructuring, 2) expected growth in demand for natural gas in Mexico, 3) market penetration of natural gas vehicles, 4) emerging technologies that could potentially displace natural gas, and 5) refinements to the Federal Energy Regulatory Commission's capacity release program.

T The Energy Commission will continue to support policies which promote consumer access to the most competitive natural gas supplies.

T The Energy Commission encourages the development of a competitive natural gas pipeline transportation market in California to complement the benefits of the capacity release program at the federal level.

T The Energy Commission will further refine the North American Regional Gas Model, especially focusing on analysis of the natural gas resource base in North America to ensure accurate long-term gas supply and price forecasts.

cooperatively to any event which has the potential to cause an energy supply disruption.

CONTINGENCY PLANNING

The Energy Commission maintains an operational and flexible energy shortage response plan, designed to work in any emergency. The plan represents a dynamic planning process to evaluate, define and respond adequately to natural disasters and man-made events alike. The Energy Commission works cooperatively with the Governor's Office of Emergency Services as well as other state, federal and local agencies, as part of the state's emergency response effort.

Since one of the functions of the Energy Commission is to ensure the adequate supply of energy for public health, safety and welfare, the plan includes a Petroleum Fuels Set-Aside Program which is used to obtain fuel for emergency responders and essential service providers who are unable to obtain sufficient supplies. The program was used in the Energy Commission's response to the Northridge earthquake on January 17, 1994, and the distribution problems associated with the introduction of reformulated diesel fuel in California beginning October 1, 1993.

The Energy Commission has also assisted local jurisdictions in improving their energy shortage preparedness through a Local Government Assistance Program. The Energy Commission developed a handbook for local emergency planners and awarded more than \$1 million in grants to 14 different local jurisdictions for the development of their own energy shortage response plan.

T The Energy Commission will maintain its high level of readiness to respond quickly and